U.S. Department
Of Transportation
Federal Highway
Administration

400 Seventh St., S.W.
Washington, D.C. 20590

May 28, 1993

Refer to: HNG-14/SS-35

Mr. John H. Clark
Imperial, Inc.
3901 Norris Drive
Millbrook, Alabama 36054

Dear Mr. Clark:

Thank you for your May 4 letter to Mr. Thomas O. Willett requesting Federal Highway Administration's (FHWA) acceptance for your company's aluminum pipe breakaway sign support. You referenced our Geometric and Roadside Design Acceptance Letter SS-28 dated May 26, 1992, which reported on small sign support testing conducted in "weak" soil and sponsored by the Florida Department of Transportation (DOT). In that letter, we accepted as breakaway 89-mm (3-in) diameter, 6061-T6 alloy aluminum tubes of 4.75-mm (0.187-in) thickness when no more than one sign support was used within a 7-foot span. The posts pulled out of the ground partially or completely, allowing the vehicle to gradually come to a stop. The signpost that you wish to use has a diameter of 60-mm (2.375 in) and a wall thickness of 5.54-mm (0.218 in). The two signposts are compared in the table below:

Sign Post	Florida DOT	Imperial, Inc.
Diameter	89 mm (3.5 in)	60 mm (2.375 in)
Wall Thickness	4.75 mm (0.187 in)	5.54 mm (0.218 in)
Alloy	6061-T6	6063-T6
Tensile Strength	310 Mpa (45 ksi)	186 Mpa (27 ksi)
Yield Strength	275 Mpa (40 dsi)	145 Mpa (21 ksi)
Cross Section Area	1257 mm2 (1.951 in2)	948 mm2 (1.477 in2)

In addition to the Florida DOT sponsored testing to which you referred, earlier tests of 100-mm (4-in) diameter thin-walled aluminum tubes were conducted in "strong" soil. These posts, which were fitted with anti-twist hardware below the groundline, fractured upon impact. They were found to be crashworthy.

Because your company's proposed aluminum tube sign support is a smaller diameter and made of a weaker allow than posts already found to be crashworthy in either strong soil or weak soil, we find the 60-mm diameter, 5054-mm thick wall tube of 6063-T6

aluminum to be acceptable for use on Federal-aid highway projects when requested by a highway agency. We would recommend, however, that a soil plate or other sort of anti-rotation device be installed below ground. This would have dual benefits of preventing the signpost from rotating, and improving the breakaway performance, especially in weak soil.

Our acceptance is limited to the breakaway characteristics of the post and does not cover its structural features. Presumably, you will supply potential users with sufficient information on structural design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Imperial, Inc., that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as the post in question, and that it will meet the FHWA change in velocity requirements.

Sincerely yours,

Lawrence A. Staron, Chief
Federal-Aid and Design Division

Federal Highway Administration
HNG-14:Nartimovich:gm:5-28-93:61331
Copies to:
HPD-1 HNG-1 HNG-10 HNG-14 Reader, 3212
Reader, 3128 Reader, 3206 File, 3128

Geometric and Roadside Design Acceptance Letter SS-35